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EXAMINER

ANGEBRANNDT, MARTIN J

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



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1. The response of the applicant has been read and given careful consideration. Responses to the arguments of the applicant appear after the first rejection to which they are directed.
2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1,2,4-6,9-11 and 15-16 are rejected under 35 U.S.C. 102(b) as anticipated by Takizawa et al. JP 2001-006215 or, in the alternative, under 35 U.S.C. 103(a) as obvious over Takizawa et al. JP 2001-006215, in view of Wreede et al. '211.

Takizawa et al. JP 2001-006215 (machine translation attached) describes two substrates of resins such as polycarbonate, polystyrene polyolefin and the like coated with SiO<sub>x</sub> on one side and MgF on the other and a photopolymerizable composition placed between them with the MgF coated sides being in contact with the photopolymer composition. The use of a moisture permeation prevention layer is disclosed. [0018].

Wreede et al. '211 shows figure2, where moisture barriers (15) are applied to the polymeric substrates (14,12,20 and 22), layers 16 and 24 are norland adhesive and the recording layer is layer 18 and only gelatin based materials or the photopolymer DMP-128 are disclosed

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for this (2/9-4/5). The disclosed materials are silicon dioxide, tin oxide and indium oxide. (2/31-38). The use of plural substrate provides the required support for the photosensitive layer (2/26+). The hydrophobic substrates can be cellulose acetate, polystyrene, polyester, PMMA, polycarbonate and co-polymers of these (2/9-38).

The examiner holds that as a photopolymer is disclosed by Takizawa et al. JP 2001-006215, it would include a photoinitiator to cause polymerization by the incident light and the reference thereby anticipates the claims.

If this position is not upheld, the examiner holds that it would have been obvious to modify the example Takizawa et al. JP 2001-006215 by using known photopolymer compositions, such as the DMP-128 taught by Wreede et al. '211 with a reasonable expectation of forming a useful holographic recording medium.

DMP-128 is a photopolymer using a dye sensitized photoinitiation. The benefit ascribed to the coating by the applicant is inherent to the resulting product, which is disclosed as preventing the migration of water, which is a much smaller molecule than those identified in the instant specification, so they would inherently prevent the migration of larger molecules and so meets the recited limitations of the claims as well as the asserted limitations of the arguments which are not recited in the claims. **The examiner notes that these barrier materials are the same materials recited in the claims.**

The applicant argues that the functionality of the layers is not disclosed (diffusion prevention). This examiner holds that this is immaterial. The  $\text{MgF}_2$  layer is present in contact with the substrate and the photopolymerizable layer used to record holograms. Their ability to function to prevent contact components of the photopolymerizable layer and the substrate is

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inherent. It is not clear what the photopolymerizable composition is beyond a free radically polymerizable composition including a monomer [0009]. The photoinitiator is not disclosed.

The position of the examiner is the layer used included a photoinitiator to sensitize the medium to the lasers or alternatively, it would have been obvious to add one to render it sensitive to lasers in the visible range as taught by Wreede et al. '211. The "acid" might not be an acid in the classical sense, but a Lewis or Bronsted acid generated during the free radical polymerization.

The applicant's arguments fail to appreciate that  $MgF_2$  and  $SiO_x$  are both discussed as acid resisting layers [0010]. The sensitization of the layer with a photoinitiator is clearly predictable.

The rejection stands.

5. Claims 1,2,4-7,9-12 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wreede et al. '211, further in view of Mishima et al. '995 and JP 64-040882.

Mishima et al. '995 teaches moisture barrier materials including metals, metal oxides, such as  $MgO$ ,  $SiO$ ,  $SiO_2$ ,  $Al_2O_3$ ,  $GeO$ ,  $NiO$ ,  $CaO$ ,  $BaO$ ,  $TiO_2$  and fluorides such as  $MgF_2$ ,  $LiF$ ,  $AlF_3$  and  $CaF_2$  [0110] used in optical display devices.

JP 64-040882 (aka JP 01-040882) teaches the use of aluminum fluoride, aluminum oxide, calcium fluoride, cerium oxide, cesium bromide, cesium iodide, magnesium fluoride, magnesium oxide, titanium oxide, zinc sulfide and zirconium oxide as inorganic protective layer materials useful in direct contact with photopolymeric holographic recording composition. (Page 3, lower left column). Useful thicknesses include 2 to 100 nm (page 3/lower right column).

To address embodiments bounded by the claims, but not rendered obvious above, the examiner holds that it would have been obvious to use polystyrene, PMMA or polycarbonate as the substrates, to use DMP-128 as the photosensitive material in the embodiments of figure 2 of

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Wreede et al. '211, based upon the disclosure to do so in the reference and using other moisture barrier materials, such as MgO, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, MgF<sub>2</sub>, LiF, AlF<sub>3</sub> and CaF<sub>2</sub> disclosed by Mishima et al. '995 with a reasonable expectation of forming a useful holographic recording medium which is protected against moisture and of these being compatible with photopolymer composition based upon the disclosure of JP 64-040882.

The applicant argues that these are not taught as barrier materials for organic materials. The examiner holds that this property is inherent and that the references Wreede et al. '211 and Mishima et al. '995 specifically discuss these materials as moisture (H<sub>2</sub>O) barrier materials and their use in protecting polymeric holographic recording media is established by JP 64-040882. The applicant is invited to show unexpected results for the recited inorganic materials over those not bounded by the claims and found in the prior art, such as silicon oxide and silicon nitride. Mishima et al. '995 and the other references are within the optical device art and therefore analogous, and one skilled in the art would be directed to these, particularly in view of the use of these materials for moisture resistance as recited in Mishima et al. '995 and Wreede et al. '211 and their established use in holographic articles as evidenced by JP 64-040882.

The applicant's arguments fail to appreciate that water is a much smaller compound than most organic compounds and that if the layer functions to prevent moisture from passing through it, then organics would also be excluded from migrating through the layer. In response to applicant's argument that the prevention of diffusion of organics is not taught, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

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This is particularly apt noting that the function of the layer as a barrier layer is known in the holographic arts. The rejection stands.

6. Claims 1,2,4-7,9-12 and 15-16 are rejected under 35 U.S.C. 103(a) as obvious over Takizawa et al. JP 2001-006215, in view of Wreede et al. '211, Mishima et al. '995 and JP 64-040882.

To address embodiments bounded by the claims, but not rendered obvious above, the examiner holds that it would have been obvious to modify the embodiments rendered obvious by the combination of Takizawa et al. JP 2001-006215 and Wreede et al. '211 by using polystyrene, PMMA or polycarbonate as the substrates, using DMP-128 as the photosensitive material based upon the disclosure to do so in the references and using other moisture barrier materials, such as MgO, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, MgF<sub>2</sub>, LiF, AlF<sub>3</sub> and CaF<sub>2</sub> disclosed by Mishima et al. '995 with a reasonable expectation of forming a useful holographic recording medium which is protected against moisture and of these being compatible with photopolymer composition based upon the disclosure of JP 64-040882.

The rejection stands for the reasons above as not further arguments were directed at this line of rejection.

7. Claims 1-7,9-12 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horigoma et al. JP 2002-123949 (machine translation provided), in view of Wreede et al. '211, Mishima et al. '995 and JP 64-040882.

Horigoma et al. JP 2002-123949 teaches a holographic recording medium shown in figures 1 and 6, where the layer 5 is a reflective layer, layer 4 is a transparent substrate (in figure 6 it is grooved), layer 3 is a photopolymer and layer 2 is a transparent substrate. [0033].

It would have been obvious to one skilled in the art to modify the medium exemplified by figure 6 of Horigoma et al. JP 2002-123949 by adding moisture barrier layers, such as taught by Wreede et al. '211 to prevent moisture damage and shifting of the replay. Further it would have been obvious to one skilled in the art to add the other substrates and adhesive layers to increase the stability/rigidity as discussed by Wreede et al. '211 and to use using other moisture barrier materials, such as MgO, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, MgF<sub>2</sub>, LiF, AlF<sub>3</sub> and CaF<sub>2</sub> disclosed by Mishima et al. '995 with a reasonable expectation of forming a useful holographic recording medium which is protected against moisture and of these being compatible with photopolymer composition based upon the disclosure of JP 64-040882.

The applicant fails to appreciate that there is a motivation, in particular one similar to that disclosed in the instant specification, to add barrier layers to prevent moisture from passing through the substrate and entering the recording layer. Clearly the barrier layer is not like a diode and functions to prevent the migration across it irrespective of which side the compound is. The rejection stands.

8. Claims 1-7,9-12 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horigoma et al. JP 2002-123949 (machine translation provided), in view of Wreede et al. '211, Mishima et al. '995 and JP 64-040882, further in view of Lawrence et al. '333.

Lawrence et al. '333 teach various substrate materials for holograms including polycarbonates, polyether imides, polyolefins (linear and cyclic) polystyrene, PMMA, polyphenylene ethers and the like [0022].

To address the embodiments bounded by the claims, but not rendered obvious by the combination of Horigoma et al. JP 2002-123949 with Wreede et al. '211, Mishima et al. '995



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and JP 64-040882, the examiner cites Lawrence et al. '333 and holds that it would have been obvious to one skilled in the art to modify the media rendered obvious by the combination of Horigoma et al. JP 2002-123949 with Wreede et al. '211, Mishima et al. '995 and JP 64-040882 by using other substrate materials such as polycarbonates, polyether imides, polyolefins (linear and cyclic) polystyrene, PMMA or polyphenylene ethers by Lawrence et al. '333 with a reasonable expectation of forming useful holographic recording media as the use of these substrate materials is known in the art as evidenced by Lawrence et al. '333.

The rejection stands for the reasons above.

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-7,9-12 and 15-20 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-11 of U.S. Patent No. 7031037 in view of Wreede et al. '211 combined with Wreede et al. '409 or Kurland et al. '970.

It would have been obvious to one skilled in the art to modify the medium claimed in U.S. Patent No. 7031037 by adding moisture barrier layers, such as those taught by Wreede et al. '211, Mishima et al. '995 and JP 64-040882 as the recited intermediate layers, with a reasonable expectation of preventing moisture damage and shifting of the replay of the holograms.

The applicant states that the prevention of diffusion of organic compounds is not taught. The examiner points to the motivation to add these layers for a different, but similar purpose, specifically preventing diffusion of water, which is a very small molecule. The position of the examiner is that this property is inherent and that one of ordinary skill in the art would recognize that based upon the ability to prevent the migration of a small molecule (water), the ability to prevent migration of larger molecules is inherent. The rejection stands.

11.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J. Angebrannndt whose telephone number is 571-272-1378. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin J Angebrannndt/  
Primary Examiner, Art Unit 1795

Martin J Angebrannndt  
Primary Examiner  
Art Unit 1795

7/8/2008